APPENDIX G

DUMMY POSITIONING PROCEDURES FOR DRIVER AND PASSENGER TEST DUMMY CONFORMING TO SUBPART O OF PART 572

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DUMMY POSITIONING PROCEDURES FOR TEST DUMMY CONFORMING TO SUBPART O OF PART 572

Seating Procedure 5th Percentile Female Driver Dummy (Part 572, Subpart O) (S16.2- S16.3)

NHTSA No. _____ Test Date: _____

Laboratory: _____ Test Technician(s): _____

Test Number: _____

__1. Position the seat's adjustable lumbar supports so that the lumbar supports are in the lowest, retracted or deflated adjustment position. (S16.2.10.1)
__ N/A – No lumbar adjustment

__2. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. (S16.2.10.2)
__ N/A – No additional support adjustment

__3. If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. (S16.2.10.3.1)
__ N/A – No independent fore-aft seat cushion adjustment

__4. Use the seat markings determined during the completion of Data Sheet 14 to set the rearmost fore-aft position, mid-height position and the seat cushion mid-angle. (S16.3.2.1.1)

__5. If the vehicle has an adjustable accelerator pedal, place it in the full forward position. (S16.3.2.2.1)
__ N/A accelerator pedal not adjustable

__6. Set the steering wheel hub at the geometric center of the full range of driving positions including any telescoping positions as determined in data sheet 14. (S16.2.9)

__7. Fully recline the seat back. (S16.3.2.1.2)
__ N/A seat back not adjustable.

__8. Place the dummy in the seat with the legs at an angle of 120 degrees to the thighs. The calves should not be touching the seat cushion. (S16.3.2.1.2)

__9. Position the dummy in the seat such that the midsagittal plane is coincident with the longitudinal seat cushion markings as determined in item 1.18 of Data Sheet 14 (S16.3.2.1.3 and S16.3.2.1.4)

__10. Hold down the dummy's thighs and push rearward on the upper torso to maximize the pelvic angle. (S16.3.2.1.5)

__11. Set the angle between the legs and the thighs to 120 degrees. (S16.3.2.1.6)

__12. Set the transverse distance between the centers of the front of the knees at 160 to 170 mm. (6.3 to 6.7 inches) Center the knee separation with respect to the longitudinal seat cushion marking as determined in item 1.18 of Data Sheet 14. (S16.3.2.1.6)
Record Knee Separation _____

__13. Push rearward on the dummy's knees until the pelvis contacts the seat back, or the backs of the calves contact the seat cushion, whichever occurs first. (S16.3.2.1.6)
__Pelvis contacted seat back.
__Calves contacted seat cushion.

__14. Gently rock the upper torso ± 5 degrees (approximately 51 mm (2 inches)) side to side three time. (S16.3.2.1.7)

__15. If needed, extend the legs until the feet do not contact the floor pan. The thighs should be resting on the seat cushion. (S16.3.2.1.8)

__16. Position the right foot until the foot is in line with a longitudinal vertical plane passing through the center of the accelerator pedal. Maintain the leg and thigh in a vertical plane. (S16.3.2.1.8)

__17. Rotate the left leg and thigh laterally to equalize the distance between each knee and the longitudinal seat cushion marking as determined in item 1.18 of Data Sheet 14. (S16.3.2.1.8)

__18. Attempt to return the seat to the foremost fore-aft position, mid-height, and seat cushion mid-angle. The foot may contact and depress the accelerator and/or change the angle of the foot with respect to the leg. (S16.3.2.1.8)
__Foremost position achieved. Proceed to step 23.
__Foremost not achieved because of foot interference. Proceed to step 20.
__Foremost not achieved because of steering wheel contact.

__19. If the dummy's legs contact the steering wheel, move the steering wheel up the minimum amount required to avoid contact. If the steering wheel is not adjustable separate the knees the minimum required to avoid contact. (S16.3.2.1.8)
__N/A- there was no leg contact
__Steering wheel repositioned
__Knees separated

__20. If the left foot interferes with the clutch or brake pedals, rotate the left foot about the leg to provide clearance. If this is not sufficient, rotate the thigh outboard at the hip the minimum amount required for clearance. (S16.3.2.1.8)
__N/A, No foot interference with pedals.
__Foot adjusted to provide clearance.
__Foot and Thigh adjusted to provide clearance.

__21. Continue to move the seat. Use seat controls to line up the seat markings determined during the completion of Data Sheet 14 to set the foremost fore-aft position, mid-height position and the seat cushion mid-angle. If the dummy contacts the interior move the seat rearward until a maximum clearance of 5 mm (0.2 inches) is achieved or the seat is in the closest detent position that does not cause dummy contact. (S16.3.2.1.8)
__Foremost, mid-height position and the seat cushion mid-angle reached
__Dummy contact. Clearance set at maximum of 5mm
Measured Clearance_____
__Dummy Contact. Seat set at nearest detent position.
Seat position ___ detent positions rearward of foremost
(foremost is position zero)

__22. If the steering wheel was repositioned in step 19, return the steering wheel to the original position. If the steering wheel contacts the dummy before reaching the original position, position the wheel until a maximum clearance of 5mm (.2 inches) is achieved, or the steering wheel is in the closest detent position that does not cause dummy contact. (S16.3.2.1.8)
__N/A Steering wheel was not repositioned.
__Original position achieved.
__Dummy contact. Clearance set at maximum of 5mm
Measured Clearance_____
__Dummy Contact. Steering wheel set at nearest detent position.
Steering wheel position ___ detent positions upward of original position.
(Original position is position zero)

__23. If the seat back is adjustable, rotate the seat back forward while holding the thighs in place. Continue rotating the seat back forward until the transverse instrument platform of the dummy head is level ± 0.5 degrees. If the head cannot be leveled using the seat back adjustment, or the seat back is not adjustable, use the lower neck bracket adjustment to level the head. If a level position cannot be achieved, minimize the angle. (S16.3.2.1.9)
__Head Level Achieved. (Check all that apply)
__Head leveled using the adjustable seat back
__Head leveled using the neck bracket.
Head Angle _____ degrees
__Head Level NOT Achieved. (Check all that apply)
__Head adjusted using the adjustable seat back
__Head adjusted using the neck bracket.
Head Angle _____ degrees

__24. Verify the pelvis is not interfering with the seat bight. (S16.3.2.1.9)

__No interference
__Pelvis moved forward the minimum amount so that it is not caught in the seat bight.

__25. Verify the dummy abdomen is properly installed. (S16.3.2.1.9)
__Abdomen still seated properly into dummy
__Abdomen was adjusted because it was not seated properly into dummy

__26. Head Angle
__N/A, neither the pelvis nor the abdomen were adjusted.
__26.1 Head still level (Go to 27)
__26.2 Head level adjusted
__Head Level Achieved. (Check all that apply)
__Head leveled using the adjustable seat back
__Head leveled using the neck bracket.
Head Angle _____ degrees
__Head Level NOT Achieved. (Check all that apply)
__Head level adjusted using the adjustable seat back
__Head level adjusted using the neck bracket.
Head Angle _____ degrees

__27. If the dummy torso contacts the steering wheel while performing step 23, reposition the steering wheel in the following order to eliminate contact.
__N/A, No dummy torso contact with the steering wheel.
__27.1 Adjust telescoping mechanism.
__N/A No telescoping adjustment.
__Adjustment performed (fill in appropriate change)
Steering wheel moved ____ detent positions in the forward direction.
Steering wheel moved ____ mm in the forward direction.
__27.2 Adjust tilt mechanism.
__N/A No tilt adjustment.
__No adjustment performed.
__Adjustment performed.
Steering wheel moved ____ detent positions Upward/Downward.
(circle one)
Steering wheel moved ____ degrees Upward/Downward
__27.3 Adjust Seat in the aft direction.
__No Adjustment performed.
__Seat moved aft ___ mm from original position.
__Seat moved aft ___ detent positions from the original position.

__28. Measure and set the pelvic angle using the pelvic angle gage TE-2504. The pelvic angle should be 20.0 degrees ± 2.5 degrees. If the pelvic angle cannot be set to the specified range because the head will not be level, adjust the pelvis as closely as possible to the angle range, but keep the head level.
__Pelvic angle set to 20.0 degrees ± 2.5 degrees.
__Pelvic angle of 20.0 degrees not achieved, the angular difference was minimized.
__Record the pelvic angle. _____ degrees

__29. Check the dummy for contact with the interior after completing adjustments.
__No contact.
__Dummy in contact with interior.
__Seat moved aft ___ mm from the previous position.
__Seat moved aft ___ detent positions from the previous position.

__30. Check the dummy to see if additional interior clearance is obtained, allowing the seat to be moved forward.
__N/A, Seat already at foremost position.
__Clearance unchanged. No adjustments required.
__Additional clearance available
__Seat moved Forward ___ mm from the previous position.
__Seat moved Forward ___ detent positions from the previous position.

__31. Driver's foot positioning, right foot. Place the foot perpendicular to the leg and determine if the heel contacts the floor pan at any leg position. If the heel contacts the floor pan proceed to step 32 otherwise, proceed to step 33.

__32. Perform the following steps until either all steps are completed, or the foot contacts the accelerator pedal. Step 32.6 shall be completed in all cases.

__32.1 With the rear of the heel contacting the floor pan, move the foot forward until pedal contact occurs or the foot is at the full forward position.

__32.2 If the vehicle has an adjustable accelerator pedal, move the pedals rearward until pedal contact occurs or the pedals reach the full rearward position.

__32.3 Extend the leg, allowing the heel to lose contact with the floor until the foot contacts the pedal. Do not raise the toe of the foot higher than the top of the accelerator pedal. If the foot does not contact the pedal, proceed to the next step. If pedal contact does occur, place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward.

__32.4 Angle the foot to achieve contact between the foot and the pedal. If the foot does not contact the pedal, return the foot to the perpendicular orientation. If pedal contact does occur, place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward.

__32.5 Align the centerline of the foot with the vertical-longitudinal plane passing through the center of the accelerator pedal. Place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward.

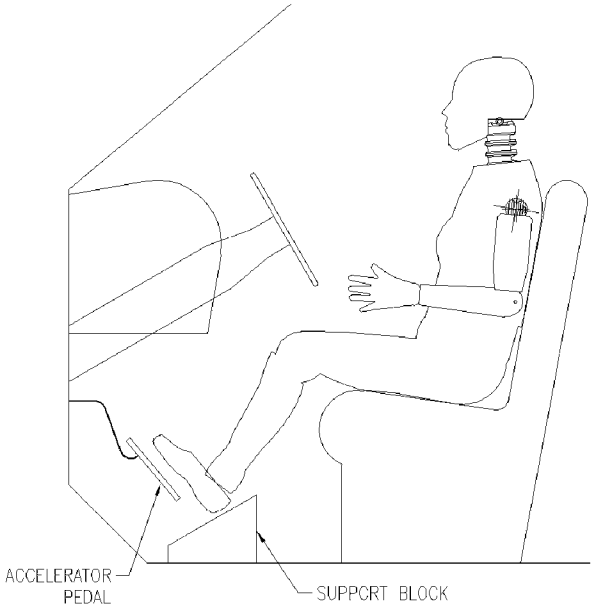
__32.6 Record foot position

__Pedal Contact achieved. Contact occurred at step _____.

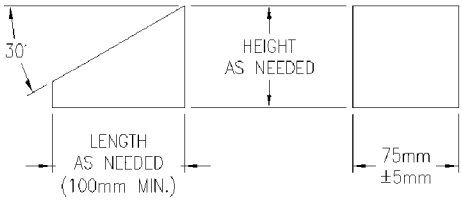
__Heel contacts floor pan

__Heel set _____ mm from floor pan.

__ Pedal Contact not achieved. Heel set _____ mm from the floor pan.



5th PERCENTILE FEMALE RIGHT FOOT SUPPORT BLOCK



SUPPORT BLOCK DETAIL

FIGURE G1

__33. Perform the following steps until either all steps are completed, or the foot contacts the accelerator pedal. Step 33.5 shall be completed in all cases.

__33.1 Extend the leg until the foot contacts the pedal. Do not raise the toe of the foot higher than the top of the accelerator pedal. If the foot does not contact the pedal, proceed to the next step. If pedal contact does occur, place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward.

__33.2 If the vehicle has an adjustable accelerator pedal, move the pedals rearward until pedal contact occurs or the pedals reach the full rearward position. If pedal contact does occur, place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward.

__33.3 Angle the foot to achieve contact between the foot and the pedal. If the foot does not contact the pedal, return the foot to the perpendicular orientation. If pedal contact does occur, place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward.

__33.4 Align the centerline of the foot in the same horizontal plane as the centerline of the accelerator pedal. Place a tapered foam block as shown in Figure G1 under the heel with the shallow part of the taper facing forward.

__33.5 Record foot position

__Pedal Contact achieved. Contact occurred at step _____.

__ Heel set _____ mm from floor pan.

__Pedal Contact not achieved. Heel set _____ mm from the floor pan.

__34. Driver's foot positioning, left foot.

__34.1 Place the foot perpendicular to the leg and determine if the heel contacts the floor pan at any leg position. If the heel contacts the floor pan proceed to step 34.2, otherwise position the leg as perpendicular to the thigh as possible with the foot parallel to the floor pan.

__34.2 Place the foot on the toe board with the heel resting on the floor pan as close to the intersection of the floor pan and the toe board as possible. Adjust the angle of the foot if necessary to contact the toe board. If the foot will not contact the toe board, set the foot perpendicular to the leg, and set the heel on the floor pan as far forward as possible. Do not place the foot on the wheel well projection or footrest. If the pedals interfere with the placement of the foot, reposition the foot by rotating the foot about the leg, or rotate the leg outboard about the hip if necessary.

__Foot rotated about the leg
__Foot rotated about the leg, and the leg rotated about the hip.
__No pedal interference

__34.3 Record foot position.

__Heel does not contact floor pan.
__Foot placed on toe board.
__Foot placed on floor pan.

__35. Driver arm/hand positioning.

__35.1 Place the dummy's upper arms adjacent to the torso with the arm centerlines as close to a vertical longitudinal plane as possible. (S16.3.2.3.1)

__35.2 Place the palms of the dummy in contact with the outer part of the steering wheel rim at its horizontal centerline with the thumbs over the steering wheel rim. (S16.3.2.3.2)

__35.3 If it is not possible to position the thumbs inside the steering wheel rim at its horizontal centerline, then position them above and as close to the horizontal centerline of the steering wheel rim as possible. (S16.3.2.3.3)

__35.4 Lightly tape the hands to the steering wheel rim so that if the hand of the test dummy is pushed upward by a force of not less than 9 N (2 lb) and not more than 22 N (5 lb), the tape releases the hand from the steering wheel rim. S16.3.2.3.4

__36. Adjustable head restraints

__N/A, there is no head restraint adjustment

__36.1 If the head restraint has an automatic adjustment, leave it where the system positions the restraint after the dummy is placed in the seat. (S16.3.4.1) Go to 37.

__36.2 Adjust each head restraint vertically so that the horizontal plane determined in item 3 of Data Sheet 14 is aligned with the center of gravity (CG) of the dummy head. (S16.3.4.3)

__36.3 If the above position is not attainable, move the vertical center of the head restraint to the closest detent below the center of the head CG. (S16.3.4.3)

__N/A midpoint position attained in previous step
__Headrest set at nearest detent below the head CG

__36.4 If the head restraint has a fore and aft adjustment, place the restraint in the foremost position or until contact with the head is made, whichever occurs first. (S16.3.4.4)

__37. Driver and passenger manual belt adjustment (for tests conducted with a belted dummy). (S16.3.5)

__37.1 If an adjustable seat belt D-ring anchorage exists, place it in the manufacturer's design position for a 5th percentile adult female. **This information will be supplied by the COTR.**

Manufacturer's specified position _____

_____

Actual Position_____

__37.2 Place the Type 2 manual belt around the test dummy and fasten the latch. (S16.3.5.2)
__37.3 Ensure that the dummy's head remains as level as possible. (S16.3.5.3)
__37.4 Remove all slack from the lap belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times. Apply a 9 N (2 lbf) to 18 N (4 lbf) tension load to the lap belt. If the belt system is equipped with a tension-relieving device, introduce the maximum amount of slack into the upper torso belt that is recommended by the manufacturer. If the belt system is not equipped with a tension-relieving device, allow the excess webbing in the shoulder belt to be retracted by the retractive force of the retractor. (S16.3.5.4)

_____ _____
I certify that I have read and performed each instruction. Date

Seating Procedure 5th Percentile Female Passenger Dummy
(Part 572, Subpart O) (S16.2- S16.3)

NHTSA No. _____ Test Date: _____

Laboratory: _____ Test Technician(s): _____

Test Number: _____

(Check this item ONLY if it applies to this vehicle.)
__The passenger seat adjustments are controlled by the adjustments made to the driver's seat. Therefore, positioning of the passenger dummy is made simultaneously with the driver dummy. Adjustments made to the seat to position the driver will over ride any adjustments that would normally be made to position the passenger. (S16.2.10.3)

__1. Position the seat's adjustable lumbar supports so that the lumbar supports are in the lowest, retracted or deflated adjustment position. (S16.2.10.1)
__ N/A – No lumbar adjustment

__2. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. (S16.2.10.2)
__ N/A – No additional support adjustment

__3. If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. (S16.2.10.3.1)
__ N/A – No independent fore-aft seat cushion adjustment

__4. Use the seat markings determined during the completion of Data Sheet 14 to set the rearmost fore-aft position, mid-height position and the seat cushion mid-angle. (S16.3.3.1.1)

__5. Fully recline the seat back. (S16.3.3.1.2)
__ N/A seat back not adjustable.

__6. Place the dummy in the seat with the legs at an angle of 120 degrees to the thighs. The calves should not be touching the seat cushion. (S16.3.3.1.2)

__7. Position the dummy in the seat such that the midsagittal plane is coincident with the longitudinal seat cushion marking that was determined in item 2.19 of Data Sheet 14 (S16.3.3.1.3 and S16.3.3.1.4)

__8. Hold down the dummy's thighs and push rearward on the upper torso to maximize the pelvic angle. (S16.3.3.1.5)

__9. Set the angle between the legs and the thighs to 120 degrees. (S16.3.3.1.6)

__10. Set the transverse distance between the centers of the front of the knees at 160 to 170 mm. (6.3 to 6.7 inches) Center the knee separation with respect to the longitudinal seat cushion marking that was determined in item 2.19 of Data Sheet 14. (S16.3.3.1.6)
Record Knee Separation _____

__11. Push rearward on the dummy's knees until the pelvis contacts the seat back, or the backs of the calves contact the seat cushion, whichever occurs first. (S16.3.3.1.6)
__Pelvis contacted seat back.
__Calves contacted seat cushion.

__12. Gently rock the upper torso ± 5 degrees (approximately 51 mm (2 inches)) side-to-side three times. (S16.3.3.1.7)

__13. If needed, extend the legs until the feet do not contact the floor pan. The thighs should be resting on the seat cushion. (S16.3.3.1.8)

__14. Use seat controls to line up the seat markings determined during the completion of Data Sheet 14 to set the foremost fore-aft position, mid-height position and the seat cushion mid-angle. If the dummy contacts the interior move the seat rearward until a maximum clearance of 5 mm (0.2 inches) is achieved or the seat is in the closest detent position that does not cause dummy contact. (S16.3.3.1.8)
__Foremost, mid-height position and the seat cushion mid-angle reached
__Dummy contact. Clearance set at maximum of 5mm
Measured Clearance_____

__Dummy Contact. Seat set at nearest detent position.
Seat position ___ detent positions rearward of foremost
(foremost is position zero)

__15. If the seat back is adjustable, rotate the seat back forward while holding the thighs in place. Continue rotating the seat back forward until the transverse instrument platform of the dummy head is level ± 0.5 degrees. If head cannot be leveled using the seat back adjustment, or the seat back is not adjustable, use the lower neck bracket adjustment to level the head. If a level position cannot be achieved, adjust the head as closely as possible to the ± 0.5 degree range. (S16.3.3.1.9 and S16.3.3.1.10)
(Check All That Apply)
__Seat back not adjustable
__Seat back not independent of driver side seat back
__Head Level Achieved. (Check all that apply)
__Head leveled using the adjustable seat back
__Head leveled using the neck bracket.
Head Angle _____ degrees
__Head Level NOT Achieved. (Check all that apply)
__ Head adjusted using the adjustable seat back
__ Head adjusted using the neck bracket.
Head Angle _____ degrees

__16. Verify the pelvis is not interfering with the seat bight. (S16.3.3.1.9)
__No interference
__Pelvis moved forward the minimum amount so that it is not caught in the seat bight.

__17. Verify the dummy abdomen is properly installed. (S16.3.3.1.9)
__Abdomen still seated properly into dummy
__Abdomen was adjusted because it was not seated properly into dummy

__18. Head Angle
__N/A, neither the pelvis nor the abdomen were adjusted.
__18.1 Head still level (Go to 19)
__18.2 Head level adjusted
__Head Level Achieved. (Check all that apply)
__Head leveled using the adjustable seat back
__Head leveled using the neck bracket.
Head Angle _____ degrees
__Head Level NOT Achieved. (Check all that apply)
__Head adjusted using the adjustable seat back
__Head adjusted using the neck bracket.
Head Angle _____ degrees

__19. Measure and set the pelvic angle using the pelvic angle gage TE-2504. The pelvic angle should be 20.0 degrees ± 2.5 degrees. If the pelvic angle cannot be set to the specified range because the head will not be level, adjust the pelvis as closely as possible to the angle range, but keep the head level.
__Pelvic angle set to 20.0 degrees ± 2.5 degrees.
__Pelvic angle of 20.0 degrees not achieved, the angular difference was minimized.
__Record the pelvic angle. _____ degrees

__20. Check the dummy for contact with the interior after completing adjustments.
__No contact.
__Dummy in contact with interior.
__Seat moved aft ___ mm from the previous position.
__Seat moved aft ___ detent positions from the previous position.

__21. Verify the transverse instrument platform of the dummy head is level +/- 0.5 degrees. Use the lower neck bracket adjustment to level the head. If a level position cannot be achieved, minimize the angle. (S16.3.3.1.9, S16.3.3.1.10, and S16.3.3.1.11)
__Head Level Achieved
Head Angle _____ degrees
__Head Level NOT Achieved.

Head Angle _____ degrees

__22. Check the dummy to see if additional interior clearance is obtained, allowing the seat to be moved forward. (S16.3.3.1.12)
__N/A Bench Seat
__N/A Seat already at full forward position.
__Clearance unchanged. No adjustments required.
__Additional clearance available
__Seat moved Forward ___ mm from the previous position.
__Seat moved Forward ___ detent positions from the previous position.
__Seat moved Forward, Full Forward position reached.

__23. Passenger foot positioning. (Indicate final position achieved) (S16.3.3.2)
__23.1 Place feet flat on the toe board; OR
__23.2 If the feet cannot be placed flat on the toe board, set the feet perpendicular to the lower leg, and rest the heel as far forward on the floor pan as possible; OR
__23.3 If the heels do not touch the floor pan, set the legs to vertical and set the feet parallel to the floor pan.

__24. Passenger arm/hand positioning. (S16.3.3.3)
__24.1 Place the dummy's upper arms adjacent to the torso with the arm centerlines as close to a vertical longitudinal plane as possible. (S16.3.2.3.1)
__24.2 Place the palms of the dummy in contact with the outer part of the thighs (S16.3.3.3.2)
__24.3 Place the little fingers in contact with the seat cushion. (S16.3.3.3.3)

__25. Adjustable head restraints
__N/A, there is no head restraint adjustment
__25.1 If the head restraint has an automatic adjustment, leave it where the system positions the restraint after the dummy is placed in the seat. (S16.3.4.1) Go to 26.
__25.2 Adjust each head restraint vertically so that the horizontal plane determined in item 3 of Data Sheet 14 is aligned with the center of gravity (CG) of the dummy head. (S16.3.4.3)
__25.3 If the above position is not attainable, move the vertical center of the head restraint to the closest detent below the center of the head CG. (S16.3.4.3)
__N/A midpoint position attained in previous step
__Headrest set at nearest detent below the head CG
__25.4 If the head restraint has a fore and aft adjustment, place the restraint in the foremost position or until contact with the head is made, whichever occurs first. (S16.3.4.4)

__26. Manual belt adjustment (for tests conducted with a belted dummy) S16.3.5
__N/A, Unbelted test
__26.1 If an adjustable seat belt D-ring anchorage exists, place it in the manufacturer's design position for a 5th percentile adult female. **This information will be supplied by the COTR.**
Manufacturer's specified position _____

_____

Actual Position_____

_____
__26.2 Place the Type 2 manual belt around the test dummy and fasten the latch. (S16.3.5.2)
__26.3 Ensure that the dummy's head remains as level as possible. (S16.3.5.3)
__26.4 Remove all slack from the lap belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times. Apply a 9 N (2 lbf) to 18 N (4 lbf) tension load to the lap belt. If the belt system is equipped with a tension-relieving device, introduce the maximum amount of slack into the upper

torso belt that is recommended by the manufacturer. If the belt system is not equipped with a tension-relieving device, allow the excess webbing in the shoulder belt to be retracted by the retractive force of the retractor. (S16.3.5.4)

_____ _____

I certify that I have read and performed each instruction. Date